INTRODUCTION TO SECONDARY RAW MATERIALS MARKETS

MODULE N°6

Co-funded by the Erasmus+ Programme of the European Union

GREEN LABS

IRFEDD LiCA CentOfOrm Academy of Entrepreneurship municipio de lousada YOUNG AMBASSADORS

2026

LEARNING OBJECTIVES

PART 1: CONCEPTS, FUNCTIONING & MARKET DYNAMICS

- Understand the concept and functioning of Secondary Raw Materials Markets (SRMs) (p5)
- Analyse the value chains and market dynamics of secondary raw materials (p29)

PART 2: TECHNICAL & POLICY FRAMEWORKS

- Identify the properties, usability and marketability of recyclable materials (p47)
- Evaluate the strengths, weaknesses and barriers affecting the development of SRMS (p70)

KEY TOPICS

1.

MARKET CONCEPTS

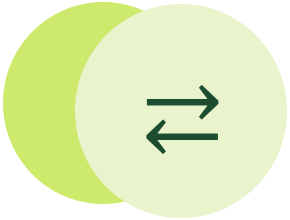
What qualifies as a Secondary Raw Material, how End-of-Waste status works, and where each material sits on the market maturity spectrum (mature, developing, emerging).

2.

MARKET FUNCTIONING & PRICING

Why SRM prices stay linked to virgin commodity prices, why that link is risky, and which policy levers can stabilise demand for secondary materials.

3.



VALUE CHAINS & DYNAMICS

The reverse-logistics journey from generation to regeneration, where value is destroyed along the way, and how public, recycling and industrial actors must align.

A glossary of key terms is included near the end of this deck — come back to it any time a word is unclear.

How This Module Works

1 Objective 1 → 2 Objective 2 → ✓ Synthesis

What's Inside

- Objective 1: what Secondary Raw Materials (SRM) are, why they matter for the economy and the environment, and how their markets work.
- Objective 2: who is involved in getting a material from waste to a usable resource, and why that process sometimes breaks down.

What You Will Be Able to Do

- Explain what makes something a Secondary Raw Material instead of just waste.
- Map out who is involved in turning a waste stream into a sellable material in your own region.
- Spot the next training topics (Objectives 3 & 4, run by Centoform) building on what you learn here.

How Long This Will Take You

~2h per objective (4h total). No live class – it's all here.

A Question to Keep in Mind

- In your region, where do local businesses still rely mostly on brand-new raw materials? Who could supply a recycled alternative instead?

As You Read, Watch For

- How "ready" a material is for trading (some materials, like metal, have mature markets; others, like mixed textiles, barely have a market yet).
- Which person or organisation could unlock – or block – a local recycling project.
- How a single new EU rule can suddenly make a recycling project profitable, or unprofitable.

Why This Matters for You

- As a Living Lab Manager, you are often the person who connects the people throwing materials away with the people who could reuse them. This module gives you the concepts to do that well.

Objective 1 · Component A

« ***INDIVIDUALIZE THE MAIN SECONDARY RAW MATERIALS MARKETS AND CATEGORIZE THEM BY MATERIAL TYPE AND ECONOMIC RELEVANCE.***

»

OBJECTIVE 1

What Is a Secondary Raw Material, Really?

- **In plain terms:** a Secondary Raw Material (SRM) is something that used to be waste, but has been collected, cleaned and sorted well enough that a factory can use it again instead of buying brand-new material.
- **The legal turning point:** a material only becomes a true SRM once it passes official "End-of-Waste" rules. Before that point, it is still legally "waste" – even if it looks perfectly reusable – and many businesses are not allowed to buy or sell it.
- **Not just "less bad", but "useful":** regular waste management is about getting rid of things safely. SRM markets are about something different: keeping a material as useful and valuable as possible, for as long as possible.

💡 **Key Strategic Insight**

Don't think of an SRM as "recycled rubbish." Think of it as a product that needs the same things any product needs to sell well: a market that wants it, people who supply it reliably, and a business model that makes money from it.

🎤 ***Self-Guided Reading Notes***

Here is the one idea to remember from this slide: normal waste collection is a public service that costs money. Building SRM markets is a business activity that can make money. As a Living Lab Manager, your job is often to help a material cross from the first world into the second – from 'cost to get rid of' to 'valuable input to sell'.

OBJECTIVE 1

Why SRM Markets Matter, Beyond “Being Green”

There are three real, practical reasons SRM markets matter – not just for the planet, but for jobs and businesses too:

01

LESS ENERGY, LESS CO2

Making aluminium from recycled metal uses about 95% less energy than mining new ore. Norway’s can-recycling alone avoided 5.7 million tonnes of CO2 in 2023.

02

LESS DEPENDENCE ON IMPORTS

Europe imports most of its raw materials from elsewhere. A strong local SRM market means a factory near you is less exposed if a foreign supplier raises prices or stops shipping.

03

GROWTH WITHOUT USING UP MORE

Using secondary materials lets local businesses keep growing without constantly needing more virgin resources dug out of the ground.

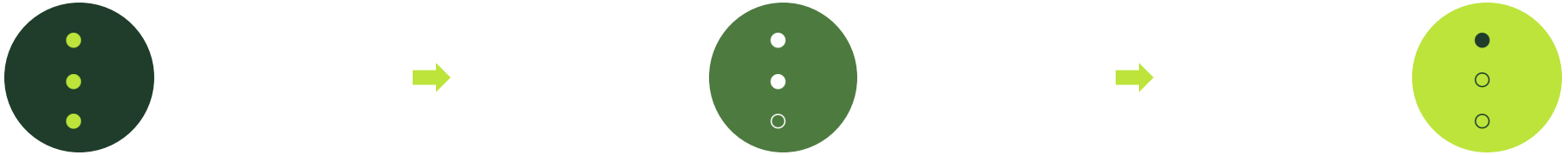
> 💡 **Key Strategic Insight**
>
> Caring about the environment is not enough to make an SRM market survive on its own. SRM markets grow because they solve a real business problem: depending on one supplier, or on a price that can suddenly spike, is risky for any company.

🎤 ***Self-Guided Reading Notes***

European rules are changing fast to require the use of SRMs. Soon, companies in your region may have no choice but to use secondary materials – it won’t be optional. A Living Lab can help local businesses get ready for this change before it becomes mandatory, instead of scrambling once the rule is already in force.

Not All Materials Are at the Same Stage

Every material sits somewhere on a maturity spectrum, from fully traded to barely organised:



Mature

Metals (steel, copper, aluminium) and glass. Clear grades and prices everyone agrees on – almost a stock market for scrap.

Developing

Paper, cardboard, common plastics (PET, HDPE), construction rubble. Real demand, but volumes depend on local sorting facilities.

Emerging

Mixed fabrics, multi-layer plastic packaging, rare metals from electronics. No agreed quality standards yet, so trading stays difficult.

DID YOU KNOW? **<1%** of used clothing waste in Europe is recycled back into new fibres – a market that barely exists yet.

(European Commission / BCG-ReHubs, 2026)

💡 Key Strategic Insight

Don't try to compete in markets that are already mature, like scrap copper – big international players already do that well. Instead, point your energy at the "developing" and "emerging" materials, where a small local project can make a real difference.

🎤 *Self-Guided Reading Notes*

Think about your own region. Do you have a lot of one kind of waste – old clothes, demolition rubble, food packaging? Knowing how mature that material's market is tells you what kind of project to try first.

OBJECTIVE 1

Why Recycled Material Prices Rise and Fall So Much

- **The trap:** the price you can get for a recycled material usually follows the price of the new ("virgin") version. If oil gets cheap, new plastic gets cheap too – and suddenly nobody wants to pay more for the recycled version.
- **Why recyclers can't just lower their prices too:** a big oil company can cut costs easily at huge scale. A recycler can't: collecting, transporting and sorting waste costs roughly the same no matter what oil is doing that week.
- **How to break this dependency:** governments can step in with rules like "this product must contain X% recycled material", or by taxing carbon, so recycled materials don't have to win on price alone.

DID YOU KNOW?

20+

recycling centres were shut down by the largest waste company in the US after the 2014-15 oil price crash made new plastic cheaper than recycled plastic.

industry reporting, Resource Recycling

💡 Key Strategic Insight

If an SRM can only survive by being cheaper than virgin material at every single moment, it will always be fragile. A market that lasts needs rules or policies behind it, not just good intentions.

🎤 *Self-Guided Reading Notes*

Remember this for your own projects: many circular-economy ideas fail because they assume a company will buy recycled material just to "do the right thing." Unless a rule forces them to, or the recycled option is clearly cheaper, most buyers go back to virgin material the moment prices shift.

OBJECTIVE 1

Why Your Region Is the Right Scale for This Work

- **Short distances win:** SRM markets work best when the material doesn't travel far. If transport costs eat up all the value, the deal stops making sense. A Living Lab, working at a regional level, is exactly the right size to make these short loops happen.
- **Small players add up:** lots of small businesses each produce a little bit of recyclable material – too little for a big national recycler to bother collecting. A Living Lab can bring these small amounts together into one large, attractive supply.
- **A safe place to test ideas:** a Living Lab gives manufacturers, waste companies and researchers a low-risk space to try out a new product made from local recycled material, before betting real money on it at full scale.

💡 **Key Strategic Insight**

Think of yourself as a "matchmaker" for your region: you connect the people who have a waste material with the businesses that could actually use it as an input.

🎤 ***Self-Guided Reading Notes***

Ask yourself: who in your area is currently throwing away something that another local business could use? You are often the missing link that makes a small, local recycling market possible – a link that normal market forces, left alone, would never create on their own.

Explore Further: Objective 1 Resources

📖 UNEP Report — 15 min read

Metal Recycling: Opportunities, Limits, Infrastructure – resourcepanel.org

Focus: A simple global overview of how scrap metal markets work, including how much metal actually gets collected versus truly recovered and reused.

🎧 Podcast — 20 min listen

A Dictionary of Finance: Circular Economy – European Investment Bank (eib.org/podcasts)

Focus: Engineers explain, in everyday language, the difference between new and recycled raw materials, and how businesses protect themselves from price swings.

📄 EEA Report 12/2022 — 15 min read

Investigating Europe's Secondary Raw Material Markets – eea.europa.eu

Focus: The key EU study on why only aluminium, paper and glass have markets that really work well today, and what is holding the other materials back.

💡 Key Strategic Insight

Use these three resources to see the ideas from this section in action, in real European industries – not just as theory.

Map an SRM in Your Own Region

This is a solo exercise – there is no group or trainer involved. Take your time and write your answers down (on paper or in a notes app) as you go. You will use these notes again later in the module.

1. **Pick one material.**
   Choose one waste material you see often in your region – for example, used cooking oil, scrap metal, cardboard, or old clothes.

2. **Check its legal status.**
   Is it still officially "waste" where you live, or does it already have an "End-of-Waste" status that lets it be sold as a normal product? If unsure, write your best guess.

3. **Place it on the maturity scale.**
   Looking back at slide 8: is this material's market mature (like scrap metal), developing (like cardboard), or still emerging/unstructured (like mixed textiles)?

4. **Name one local actor.**
   Write down one real organisation, company, or public service in your region that already collects, sorts, or buys this material – even informally.

5. **Note one physical trait.**
   Is your material usually clean or contaminated? A single type or a mixed blend? This detail often decides its real value – exactly what Centoform's Objective 3 will teach you to assess properly.

💡 Key Strategic Insight

Keep this sheet – you'll reuse the same material in the Objective 2 exercise and in Centoform's modules.

Objective 1 · Component B

« *RECOGNISE THE ROLE OF SRMS WITHIN CIRCULAR ECONOMY SYSTEMS AND SUSTAINABLE PRODUCTION MODELS.* »

You now know what an SRM is and how its market reacts to price. Next: who actually does the physical work of turning waste into a usable material? That is Objective 2.

How Material Travels Backwards, From Bin to Factory

A normal supply chain goes one way: one factory to many customers. Recycling works backwards – it collects tiny, scattered amounts of material from millions of people. This happens in four steps:

1 → 2 → 3 → 4

Generation

Someone throws away or sets aside a used item or factory scrap.

Collection

Trucks and local sorting centres gather the scattered material together.

Sorting & Upgrading

Machines or people separate it by material type and quality.

Regeneration

The sorted material is melted or processed into a raw material a factory can actually use.

DID YOU KNOW? **600x** more concentrated some metals are in one tonne of old mobile phones than in natural rock – up to 53kg copper, 141g gold, and 3.3kg rare earth metals. *(ScienceDirect, critical metals in mobile phones study)*

💡 Key Strategic Insight

A normal factory controls exactly what comes in. A recycling chain does not – it depends entirely on whether people sort their waste correctly before it even leaves their home or workplace.

🎤 *Self-Guided Reading Notes*

Example: if someone throws a greasy pizza box into the paper bin, they damage step 1 (Generation) – and that mistake can ruin the whole batch by step 4 (Regeneration). This is why Living Labs focus so much on how people sort, not just on machines.

OBJECTIVE 2

Where Value Gets Lost Along the Way

- **Mixing the wrong things together:** if you mix two plastics that shouldn't go together (like PET bottles and PVC pipes), the whole batch becomes lower quality – sometimes it can't be sold at all.
- **Paying more to ship than the material is worth:** empty bottles or loose foam take up a lot of space but weigh very little. If you ship them too far without compacting them first, the transport bill can be bigger than what you get paid for the material.
- **Missing equipment:** without the right local sorting technology, perfectly good material ends up burned or buried simply because no machine nearby could separate it properly.

DID YOU KNOW?

-99%

how much global plastic scrap imports to China fell within a single year after its 2018 "National Sword" policy banned almost all contaminated loads.

Yale E360 / Operation National Sword

💡 **Key Strategic Insight**

To make a local recycling market actually work, find the exact point where value is being lost in your region's process – then fix that one point, instead of trying to fix everything at once.

🎤 ***Self-Guided Reading Notes***

Look for these losses in your own area. Are local companies paying a lot of money to ship their factory scrap far away because nobody nearby can sort it? If so, that's a clear opportunity: a Living Lab could set up a small local pre-sorting step that keeps that value in the region instead of losing it to transport costs.

Objective 2 · Component A

« IDENTIFY THE MAIN ACTORS AND STAGES IN SRM VALUE CHAINS, INCLUDING INDUSTRY, RECYCLERS AND PUBLIC SECTOR. »

OBJECTIVE 2

Who Needs to Agree for a Market to Work

Three groups of people, who often want different things, all need to work together for a local SRM market to function:

01

PUBLIC SECTOR & ECO-ORGS

They plan regional waste collection, enforce the rules, and run schemes that make producers pay for recycling (called EPR). They often pay for collection that wouldn't otherwise make money.

02

RECYCLERS

The people who do the physical work: trucks, sorting centres, processing plants. They need a large, steady amount of material to make their expensive machines worth the investment.

03

MANUFACTURERS (THE BUYERS)

The companies and brands who buy the finished recycled material to make new products. They need a reliable supply, a stable price, and very clean material.

💡 Key Strategic Insight

These three groups often want opposite things: recyclers want to sell at a high price to cover their costs, while manufacturers want to buy cheap. A Living Lab can be the neutral space where they negotiate and find a deal that works for everyone.

🎤 Self-Guided Reading Notes

As a Living Lab Manager, you don't own any trucks or factories yourself. Your real power is being able to bring these different groups to the same table and help them agree on something that none of them could have set up alone.

OBJECTIVE 2

New Jobs Created by SRM Markets

- **Ressourceur ("resource scout"):** a role focused entirely on identifying and unlocking local stocks of secondary raw materials in a given territory – very close to what a Living Lab Manager does.
- **Sorting plant operator/technician:** runs and maintains the sensor-based sorting lines that separate plastics, metals and paper at high purity (see slide 24's reverse supply chain steps).
- **Circular economy project manager:** leads a company's or region's shift toward secondary materials and tracks the EU rules and EPR schemes that affect the business case.
- **Green logistics coordinator:** designs and runs the reverse-logistics routes that bring scattered waste streams back to processing plants efficiently.

DID YOU KNOW?

500,000

jobs the French environment agency (ADEME) estimates the re-use and repair sector alone could create by 2030 – and these jobs are local: collection, sorting and repair cannot be outsourced abroad.

ADEME, via circularplace.fr

💡 **Key Strategic Insight**

Many of these roles barely existed ten years ago. As a Living Lab Manager, you sit at the crossroads of several of them – part ressourceur, part project manager, part logistics coordinator.

🎤 ***Self-Guided Reading Notes***

If you are mentoring someone into this field, these are concrete job titles to point them toward – not just "sustainability" in the abstract.

Objective 2 · Component B

« *ANALYSE THE ECONOMIC AND OPERATIONAL DYNAMICS OF SRM MARKETS.* »

OBJECTIVE 2

Why Recycling Markets Need Rules, Not Just Good Will

- **Waste doesn't stop coming just because demand drops:** in a normal market, if fewer people want to buy something, less of it gets made. But people keep throwing away waste no matter what – so when demand for recycled material drops, there's nowhere for the extra material to go, and prices crash.
- **How EPR helps:** "Extended Producer Responsibility" (EPR) means manufacturers pay a fee that helps fund collection and sorting. This money keeps the system running even when selling the recycled material alone wouldn't cover the costs.
- **How recycled-content rules help:** if a law says "this product must contain at least X% recycled material", that creates guaranteed buyers – so the market for recycled material doesn't depend only on how cheap new material happens to be that month.

DID YOU KNOW?

€3.1B

paid every year by manufacturers into European packaging recycling schemes (EPR) – the financial backbone that keeps sorting and recycling profitable even when material prices fall.

EUROPEN, EPR for used packaging factsheet

💡 **Key Strategic Insight**

Just collecting more waste is not enough to keep a recycling market alive. It also needs rules that guarantee someone will buy the material – otherwise the whole system can collapse when prices drop.

🎤 ***Self-Guided Reading Notes***

This is why keeping an eye on new European rules matters so much for your work. A single new EU regulation can turn a recycling stream that was losing money into a genuinely profitable local business, almost overnight.

Explore Further: Objective 2 Resources

🏭 Industry Reference — 15 min read

Sensor-Based & Optical Sorting Technology – tomra.com

Focus: A simple technical look at how sensors and cameras let modern sorting plants separate plastics and metals very precisely – this is the machinery behind step 3 of the timeline you just saw.

📦 Case Study — 20 min read

Closing the Loop with PET: Bottle-to-Bottle Recycling – petcore-europe.org

Focus: How European companies work together to keep used plastic bottles in a closed loop – turned back into new bottles – and what is still stopping them from collecting even more.

🎧 Podcast — 15 min listen

Recycled Content Podcast – Association of Plastic Recyclers (podcasts.apple.com)

Focus: Industry experts explain, in plain language, how the EPR rules from this section actually change who pays for recycling in practice – and why.

💡 Key Strategic Insight

Pay close attention to the PET case study: notice exactly where value gets lost – usually at the point where the material changes hands from one company to another.

Trace the Value Chain for Your Material

Take the material you chose in the Objective 1 exercise. Now you will follow it through the four stages of a reverse supply chain (slide 24) and look for where its value might be lost.

1. **Walk through the four stages.**
   For your material, write one line for each stage: Generation (where does it come from?), Collection (who picks it up?), Sorting (who separates it by type/quality?), Regeneration (who turns it back into a usable raw material, if anyone does, locally)?

2. **Spot a missing link.**
   Is any of these four stages missing or very weak in your region? That gap is usually where the local market breaks down.

3. **Identify the conflicting interests.**
   Who would want a higher price for this material (the collector or recycler), and who would want a lower price (the buyer or manufacturer)? Name them if you can.

4. **Write one sentence as a Living Lab Manager.**
   Finish this sentence: 'If I wanted to strengthen the local market for this material, the first thing I would do is …'

💡 Key Strategic Insight

There is no single correct answer here – the goal is to practise the four-stage thinking so it becomes automatic when you look at any material stream in your work.

Put It All Together: A Full Scenario

This combines both objectives. A region produces large amounts of used mattress foam. No local factory currently buys it, and citizens have started dumping it illegally. Work through the questions below using what you learned in Objectives 1 and 2.

1. **Objective 1 question.**
   Is mattress foam likely a mature, developing, or emerging/unstructured market? What tells you that, based on what you read about market maturity?

2. **Objective 1 question.**
   What single rule or policy (recycled-content quota, Green Public Procurement, EPR fee) could create real demand for this material, and why?

3. **Objective 2 question.**
   Walk through the four reverse-logistics stages for this foam. Which stage is most likely missing or broken, given that it's being dumped illegally?

4. **Objective 2 question.**
   Name the three stakeholder groups from Objective 2 and one realistic interest each of them would have in solving this problem.

5. **Your move.**
   Write one sentence describing the first action you, as a Living Lab Manager, would take this month.

Key Strategic Insight

There's no single right answer here – the goal is practising how both objectives combine in real work.

MODULE 6 MILESTONE

Handover to Technical & Policy Frameworks

- **Objective 1 completed:** what an SRM is, why it matters for the economy and the planet, and how to tell a mature market from a brand-new one.
- **Objective 2 completed:** how material travels backwards from bin to factory, where value gets lost along the way, and who needs to agree for the market to work.

WHAT AWAITS YOU NEXT :

- **Objective 3 – Material Usability & Standards:** physical/technical properties, quality grading, industrial usability criteria.
- **Objective 4 – Barriers & Regulatory Deep Dives:** EU Green Deal frameworks and the Critical Raw Materials Act.

💡 **Before You Continue**

Before you move on, make sure you can explain in your own words why two material streams that look almost identical – but are in different regions – can sell for very different prices. That's the key idea that connects this previous slides to material-focused training.

Glossary: Key Terms

Quick definitions for terms used throughout this module

EPR (Extended Producer Responsibility / Responsabilité Élargie du Producteur)
A rule that makes manufacturers pay a fee toward the cost of collecting and recycling their products once consumers are done with them.

End-of-Waste (sortie du statut de déchet)
The official legal procedure by which a material stops being classified as "waste" and becomes a standard commodity that can be freely bought and sold.

Green Public Procurement (achat public responsable)
A policy where public bodies (governments, municipalities) commit to buying products that contain recycled or secondary materials.

Matière première vierge (Virgin raw material)
A raw material extracted directly from nature (mined, drilled, harvested) rather than recovered from waste.

Reverse logistics (logistique inverse)
The process of collecting, sorting and transporting used materials backwards, from many scattered consumers to a central processing point – the opposite direction of normal product distribution.

Réemploi vs SRM – the key distinction
Re-use (réemploi) means a product or part NEVER becomes legal waste – it is removed, checked, sometimes repaired, and put back into service for the same purpose (e.g. a repaired roof beam). An SRM, by contrast, has passed through the legal status of "waste" and re-emerges as a raw material after an End-of-Waste procedure (e.g. scrap metal melted into new ingots). Re-use protects the object; SRM markets recover the material.

KEY TOPICS

1.

PHYSICAL & TECHNICAL PROPERTIES

Shape, particle size, density, composition and purity all determine whether a material can be recycled and at what grade.

2.

QUALITY STANDARDS

Quality thresholds, sorting precision and material specifications define whether recovered materials meet industrial standards and unlock market access.

3.

ECONOMIC VALUE

Recyclable materials carry real market value. Their price depends on quality, volume, global commodity trends and end-use demand from manufacturers.

« RECOGNIZE THE PHYSICAL AND TECHNICAL CHARACTERISTICS THAT DETERMINE RECYCLABILITY, REUSE POTENTIAL AND MARKET GRADE. »

PHYSICAL PROPERTIES OF RECYCLABLE MATERIALS

Did you know?

Morphology: Shape, particle size, density and moisture content affect processing efficiency and the type of recycling technology applicable.

Fine particles are a major headache: they fall through sorting screens and end up in landfill. C&D shredder fines commonly account for 10–20% of recyclers' daily inbound stream.

Composition: Chemical and material composition (e.g. alloy type, polymer grade, fibre length) determines end-use suitability and value.

A smartphone contains nearly all 17 rare earth elements, plus gold and palladium. Yet only ~1% of the rare earths in e-waste are recycled – the 5 billion end-of-life phones discarded by 2022 hold ~$9.25 billion in recoverable metals.

Contamination: The presence of impurities, mixed materials or hazardous substances reduces recyclability and depresses market value significantly.

A single food scrap can ruin a whole batch of paper recycling: grease floats to the top of the pulp slurry and can't be separated from the fibres. A few stray PVC containers can also spoil a PET recycling batch.

TECHNICAL CHARACTERISTICS FOR RECYCLABILITY

01 RECYCLABILITY

Activities to obtain recovered resources for use in a process or a product, excluding energy recovery. Depends on material design, sorting technology and processing infrastructure.

Source: ISO 59004:2024 (Circular economy – Vocabulary)

02 REUSE POTENTIAL

The capacity of a product or component to be reused through remanufacture – restored to as-new condition with equivalent performance and warranty. Relies on disassemblability and geometric integrity.

Source: BS 8887-220:2010 (MADE – Remanufacture Specification)

03 MARKET GRADE

Standardised classification of recyclability (Grade A ≥95%, B ≥80%, C ≥70% by weight) that determines eligibility for specific industrial uses and price brackets.

Source: EU PPWR (2025) & EN 643 for paper grades

04 SORTING & PROCESSING

Modern MRFs combine Near-Infrared (NIR) optical sorters, eddy current separators and AI-powered vision to identify polymers, metals and fibres. Higher purity = higher grade.

Source: EPA & NRT/BHS industry reports on MRF technology

LEARN MORE

Self-learning

PHYSICAL PROPERTIES OF RECYCLABLE MATERIALS AND IMPLICATIONS FOR RESOURCE RECOVERY

The study examines how key physical properties of recyclable waste, density, particle size, and shape, affect the efficiency of mechanical sorting in waste management systems and how this understanding can improve material recovery.

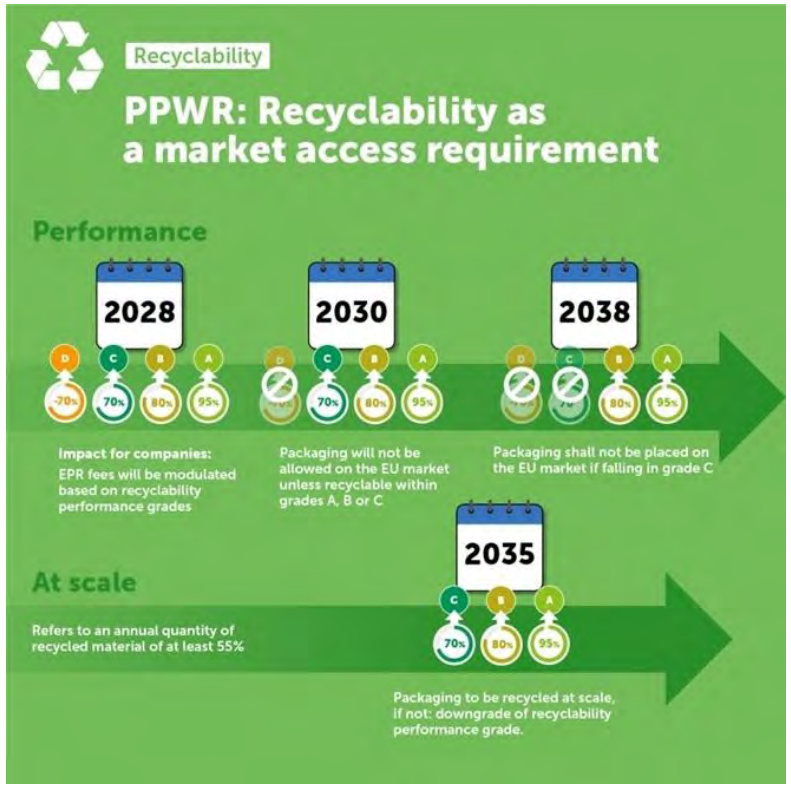
Click to read full article

While you read – focus on:

- Which barrier type (technical, economic, regulatory) receives the most attention?
- Are any of the examples familiar from your own national or regional context?
- What solutions does the video suggest or imply?

HOW IS MARKET GRADE DETERMINED?

PPWR	**Packaging & Packaging Waste Regulation (2025)** Defines Grades A/B/C by % recyclable weight; sets 2030 and 2038 deadlines for EU-wide compliance.
EN 643	**European List of Standard Grades – Paper & Board** Classifies recovered paper into 5 groups: ordinary, medium, high, kraft, special grades.
18065:2025	**Recycled Plastics – Data Quality Levels** Classifies recycled plastics by data depth (DQL) for use and digital trading platforms.
End-of-Waste	**EU End-of-Waste Criteria** Specifies when waste becomes a secondary raw material. Covers iron, steel, aluminium, glass and copper.



WHAT DETERMINES THE GRADE?: THE 5 CRITERIA

1

Material composition

Mono-material beats multi-layer; metallic films hinder recyclability.

2

Sortability

Must be NIR-detectable; carbon-black plastics are invisible to MRF sorters.

3

Contamination

Food residues, inks and adhesives lower the grade of recovered material.

4

Scale of recycling

By 2035 packaging must be recyclable at scale across most EU countries.

5

Output quality

High grades produce clean recyclates that substitute virgin material.

FostPlus, 2025

EXAMPLE: THE CLASSIFICATION OF MATERIALS

Material	Physical Form	Market Grade	Recyclability	Energy Saved vs. Virgin	Typical 2nd Life	Key Challenge
Aluminum	Sheet / Foil / Can	Grade A (clean)	95%	95%	New cans, auto parts	Coatings & lacquers reduce grade
HDPE Plastic	Rigid containers	Grade B (sorted)	70%	88%	Pipes, benches, bottles	Color mixing limits reuse
Paper / Cardboard	Flat / corrugated	Grade C (mixed)	60%	60%	Packaging, insulation	Fibres degrade after 5-7 cycles
Steel / Iron	Scrap / beams	Grade A (clean)	85%	74%	Rebar, car bodies	Separating alloys is complex

«EVALUATE THE USABILITY OF RECYCLABLE MATERIALS IN PRODUCTION SYSTEMS AND ASSESS THEIR ECONOMIC MARKETABILITY»

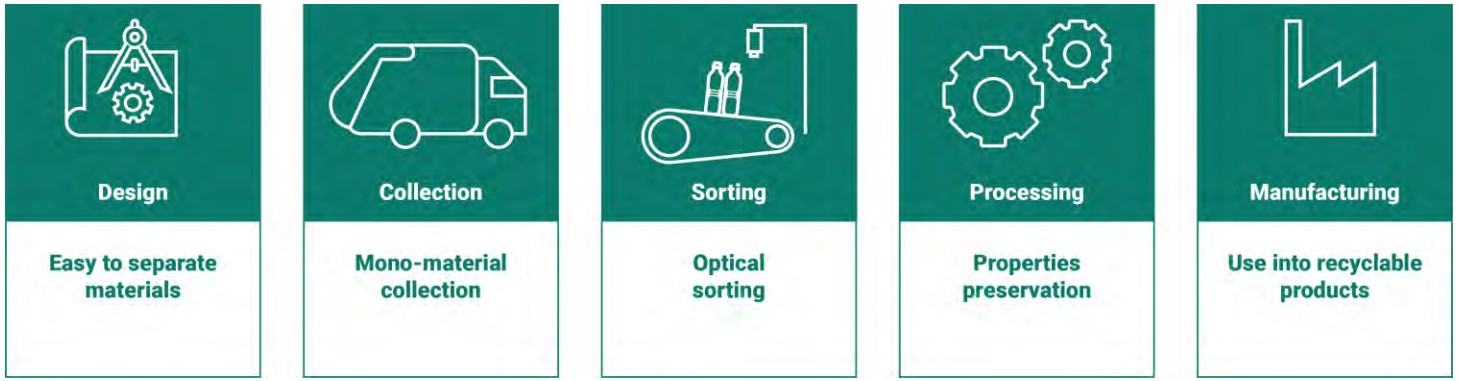
RECYCLING QUALITY AND RECYCLING PATHWAYS

Key factors along the recycling value chain

- **Product design –** mono-material packaging lifts recyclability from 30% to over 90%.
- **Collection systems –** EU recovery jumps from 40% (mixed) to 75% (separate).
- **Sorting technologies –** NIR optical and AI robotics reach >95% purity.
- **Recycling technologies –** chemical recycling preserves polymer properties and prevents downcycling.
- **Secondary markets –** EU EPR schemes and recycled-content targets close the loop.

Recycling quality is influenced across the entire value chain, but it largely depends on decisions made **early in a product's life cycle**. Circular design ensures materials are homogeneous and uncontaminated, making them easier to recycle efficiently.

EU policies such as the **Ecodesign for Sustainable Products Regulation** (in force since 2024) introduce mandatory Digital Product Passports and recyclability scores to drive quality improvements.



The recycling value chain and opportunities for increasing recycling quality.

QUALITY STANDARDS & USABILITY

ISO 14021 *Global*

RECYCLED CONTENT CLAIMS

- Defines 3 claim tiers: pre-consumer, post-consumer, recycled content %
- Self-declared – but must be verifiable, accurate and not misleading
- Underpins EU Green Claims Directive & PPWR labelling rules

EN 13242 / 12620 *EU – Construction*

RECYCLED AGGREGATES

- EN 13242: aggregates for civil engineering & road construction
- EN 12620: aggregates for concrete – max 5% fines for recycled use
- Testing: density, water absorption, chloride & sulphate content

End-of-Waste *EU Reg. 333/2011+*

EU REGULATORY THRESHOLD

- Fe/steel & Al scrap: Reg. 333/2011 – foreign matter ≤ 2%
- Glass cullet: Reg. 1179/2012 – ≥ 90% recovered for melting
- Copper: Reg. 715/2013 – enables free trade as a product, not waste

Drop-in Ready

- Match virgin material specs: purity, particle size, moisture
- No retooling needed – recyclate feeds the same production line
- Examples: rPET bottle-to-bottle, Al cans closed-loop, rHDPE pipes

LEARN MORE

Self-learning

MEASURING THE QUALITY OF RECYCLING

This briefing offers a practical definition of recycling quality as an approach to improving waste management operations and increasing circularity in Europe. It is published in support of the EU's circular economy action plan.

While you read – focus on:

- Why recycling should prioritise both quality and volume, not just quantity
- What defines high-quality recycling beyond material properties
- How system efficiency, technology, and markets influence recycling outcomes
- Which practical measures improve recycling quality, collection, sorting, and closed-loop systems

Click to read full article

ZERO WASTE COMMUNITIES

A Zero Waste Community is a municipality or region committed to redesigning resource flows so that all products are reused, recycled or composted – sending nothing to landfill or incineration. The movement combines grassroots action, municipal policy and EU-level advocacy.

ZERO WASTE ITALY *National level (Italy)*

Grassroots municipal movement

- Founded 1996 – coalition of municipalities, NGOs and researchers led by Rossano Ercolini (Goldman Prize 2013)
- Over 330 Italian municipalities have signed the Zero Waste Strategy, committing to 10 steps toward 2030
- Capannori (Tuscany) was the first European municipality to adopt a Zero Waste goal in 2007 – reached 82% separate collection
- Drives pay-as-you-throw schemes, door-to-door collection and reuse centres

Source: Zero Waste Italy

ZERO WASTE EUROPE *European level*

Network of cities, communities & NGOs

- Founded 2014 – federation of 35+ national & local Zero Waste organisations across 28 European countries
- Coordinates the Zero Waste Cities programme, currently certifying 500+ municipalities representing 11M+ inhabitants
- Advocates at EU level on the Circular Economy Action Plan, PPWR, Ecodesign and waste-shipment rules
- Publishes the Mission Zero Academy and case studies on best-practice cities

Source: Zero Waste Europe

ZERO WASTE, WHY SO IMPORTANT?

80%+

of the world's population lives in a country in ecological deficit

1.7

Earths' worth of resources consumed every year

since 1970s

humanity has been in global ecological overshoot

Source: Global Footprint Network

What Zero Waste is NOT

100% recycling & composting

Recycling matters, but Zero Waste prioritises prevention, design and reuse first. Recyclability can normalise single-use – a reusable bag beats a recyclable one.

Absolutely zero discarded items

Zero Waste does not mean nothing is thrown away. Following the ZWIA definition, it means diverting at least 90% of materials from landfill and incinerators.

Zero Waste to Landfill only

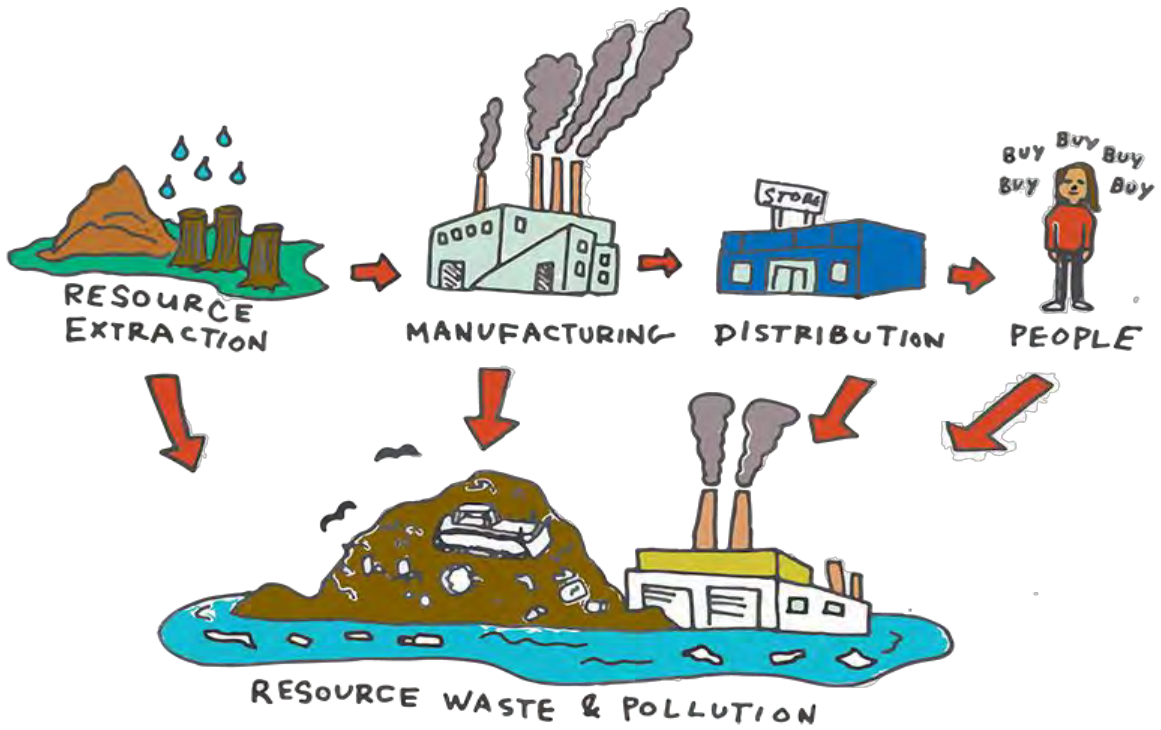
Targeting only landfill accepts incineration and waste-to-energy. Burying or burning resources forfeits their highest and best use and fuels more raw-material extraction.

Waste management focus

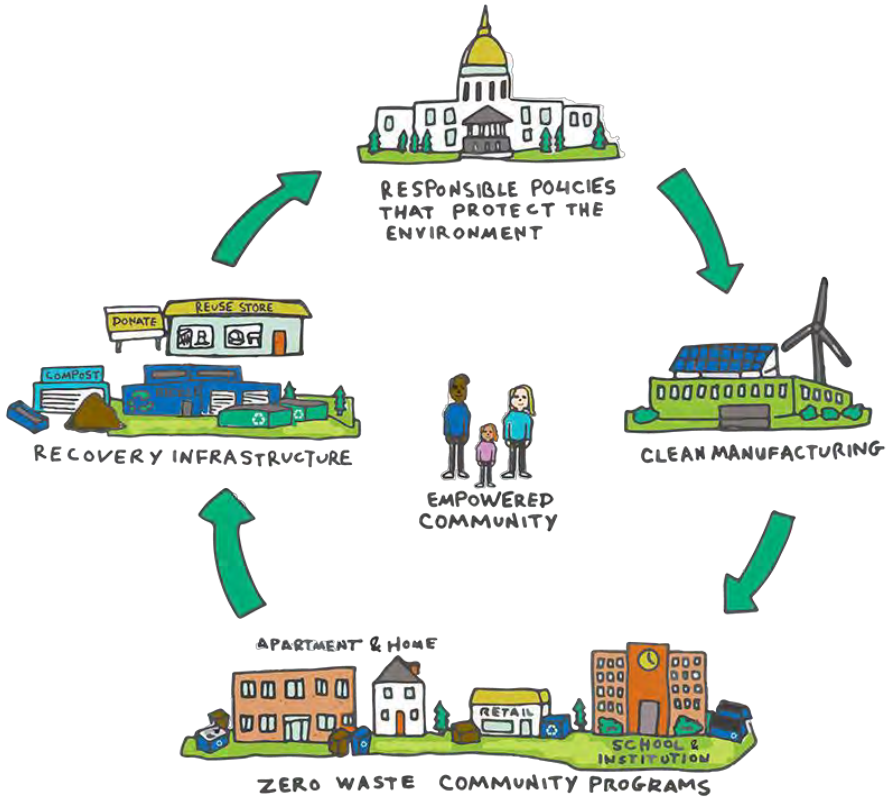
Today's system manages waste. A Zero Waste system treats everything as a resource and manages the product's entire life cycle – not just its end.

ZERO WASTE, WHY SO IMPORTANT?

Our current system is a linear production-consumption-disposal model that looks like this:



A Zero Waste system is cyclical (the way resources flow in nature) and it looks like this:

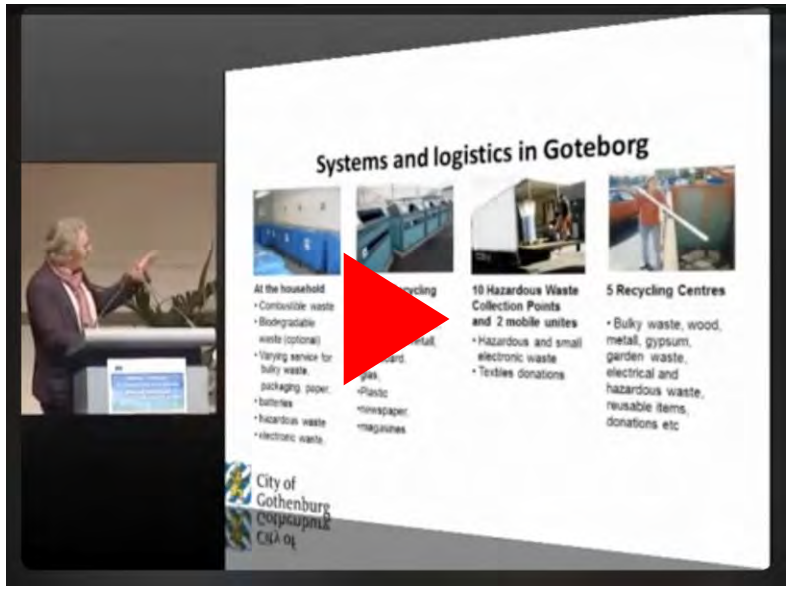


LEARN MORE

Self-learning

LIVE CASE STUDY: ECOPARK IN GOTHENBURG

Pål Mårtensson, Coordinator, Department of Sustainable Water and Waste Management, City of Gothenburg describes the exciting approach being taken to to maximising reuse, recovery, and recycling - making doing the right thing enjoyable at the Kretsloppsparken Alelyckan. Footage from the 16th European Forum on Eco-Innovation, held in Hannover,



Click to watch the video

While you read – focus on:

- Try to identify good practices that you could bring to your local reality
- How they overcome the challenges during the process
- Which practical measures improve recycling quality, collection, sorting, and closed-loop systems

USABILITY IN PRODUCTION SYSTEMS

•The usability of a recycled material in an industrial process depends on its ability to replace virgin inputs without requiring modifications to equipment, processes or end-product quality. This is known as “drop-in compatibility.”

•Key factors include: material consistency across batches, certified absence of contaminants, compliance with sector-specific standards (e.g. food-grade, automotive-grade), and price competitiveness vs. virgin equivalents.

In short: *usability is not only a technical property of the material – it is the intersection of four curves (consistency, purity, standards, price). A recyclate becomes truly "drop-in" only when all four align, which is why only a handful of streams (rPET, aluminium, steel scrap) reach that threshold today at industrial scale.*

USABILITY IN ACTION: 3 CURRENT CASES

AUTOMOTIVE Sector

BMW Group

Uses secondary aluminium from post-consumer scrap in body panels of the i Vision Circular concept. Target: 50% recycled aluminium content across models by 2030.

PACKAGING Sector

Coca-Cola Europe

EFSA-approved rPET flake is fed directly into existing blow-moulding lines. 100% rPET bottles already sold in 12 EU markets; rest of EU to follow under PPWR.

CONSTRUCTION Sector

ArcelorMittal XCarb

Electric-arc furnace route melts 75–100% recycled steel scrap. Drop-in replacement for virgin structural sections with −70% CO_2 vs. blast-furnace steel.

Sources: BMW Group Sustainability Report 2023 ; Coca-Cola EU press releases ; ArcelorMittal XCarb® product data

Once a recovered material meets technical and regulatory standards, a second question arises:

will the market pay for it?

THE RETUNA SHOPPING CENTER

•To answer the question from the previous slide**, watch this video** showing a successful example of how recycled and second-hand materials can be reused and marketed effectively.

•The example demonstrates that, when properly designed, communicated, and positioned, products made from recycled or reused materials **can become attractive and valuable for consumers**. Sustainability does not reduce the appeal of a product, in many cases, it can become part of its added value and identity.

SECONDARY RAW MATERIALS IN THE GLOBAL MARKET

Secondary raw materials still account for a small but growing share of global material consumption – concentrated in metals, paper and glass, with plastics lagging.

7.2%

Global circularity rate

Share of secondary materials in ~100 Gt/yr of global material use (CGR 2024)

12.2%

EU circular material use rate

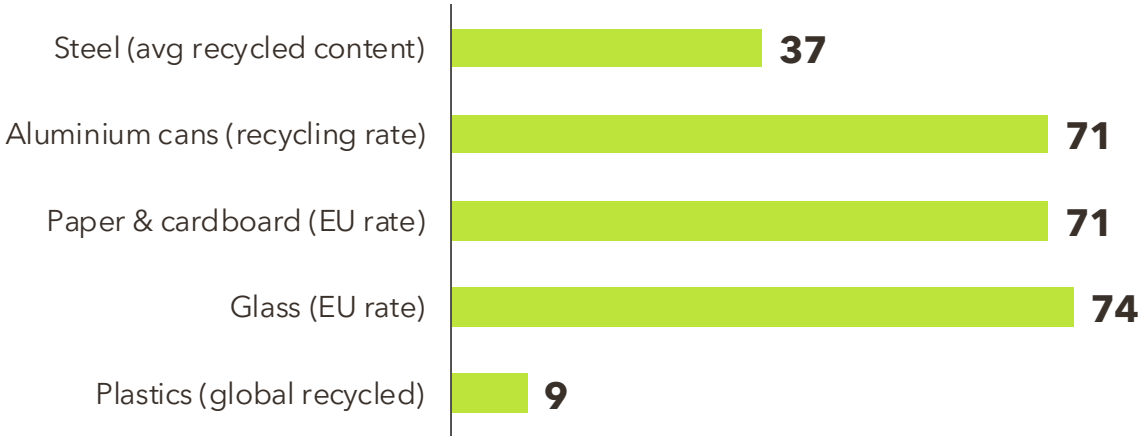
Up from 10.7% in 2010 – target of 22.4% by 2030 (EEA 2024)

~85%

Linear economy still dominates

Over 90% of global materials are wasted, lost or locked in long-life stocks

Recycled content / circularity by material (global)



Key dynamics

- **Metals lead circularity:** 23% of EU metal use is secondary; scrap-based EAF = 25% of global steel output.
- **Plastics & fossil-based lag:** only ~9% of plastics recycled globally; EU fossil-material CMUR just 3.8%.
- **Construction minerals = volume:** >50% of EU material consumption; key lever to lift the global rate.
- **Policy push intensifying:** EU Clean Industrial Deal targets 24% CMUR by 2030 (vs. 12.2% today).

Sources: Circularity Gap Report 2024 (Circle Economy).

PRICE DRIVERS & MARKET FACTORS

Supply & Demand: The availability of recyclable feedstock and manufacturer demand for secondary materials are the primary price drivers. High-quality sorted streams command premium prices.

Material Quality & Grade: Purity, contamination rate, and particle size directly affect the price achieved. Grade A materials can sell for 2–3 times the value of mixed-grade equivalents.

Global Commodity Markets: Recyclable material prices track virgin commodity prices on international markets. When virgin aluminum or copper prices rise, secondary material values follow.

Regulatory Environment: EU regulations (Green Deal, End-of-Waste criteria, Extended Producer Responsibility) increasingly mandate recycled content, creating structural demand and price stability for certified materials.

INDUSTRIAL APPLICATIONS

MANUFACTURING SECTOR

•Recycled aluminum, steel and copper are widely used as secondary raw materials in automotive, electronics and packaging manufacturing. They reduce production energy by up to 95% vs. virgin extraction.

•Secondary polymers (recycled HDPE, PET, PP) are increasingly used for industrial components, pipes, and consumer goods packaging.

•Key requirement: consistent grade and purity. Certified secondary materials integrate into closed-loop supply chains across leading manufacturers.

CONSTRUCTION SECTOR

•Recycled aggregates, glass wool, reclaimed steel and secondary timber are used in building construction, reducing embodied carbon and material costs significantly.

•EU standards (EN 13242, EN 12620) certify recycled aggregates for structural use in civil engineering and concrete applications.

SYNTHESIS & KEY TAKEAWAYS

High-grade secondary materials can substitute virgin inputs across a wide range of industrial applications.

- **Physical & Technical Properties:** Shape, density, composition and contamination level determine grade and recyclability.
- **Quality Standards:** International and EU standards (ISO, EN) certify material quality and enable industrial integration.
- **Marketability:** Price is driven by purity, volume, commodity markets and regulatory demand for recycled content.
- **Industrial Applications:** Secondary materials are used in manufacturing, construction, energy and packaging across the EU.

IN DEPTH MATERIALS FOR READING

Process of Recycling Millions of Waste Aluminum Cans Into New Materials In Factory [Video]

The video visually shows how aluminium is processed, recycled, and prepared for reuse, illustrating the concepts explained in the previous slides. The final result is recycled aluminium cans.

https://youtu.be/mp4j3npcXUc?si=TR-54spLP6N1N1Ai

Is All Recycled Material Created Equal? [Article]

This article explains how plastic can be recycled in different ways depending on its prior treatment. It highlights how small variations can lead to significantly different types of recycled materials.

https://plasticsrecycling.org/resources/is-all-recycled-material-created-equal/

Building Sustainable Markets: Overcoming Barriers to Recycled Materials Futures Contracts [Article]

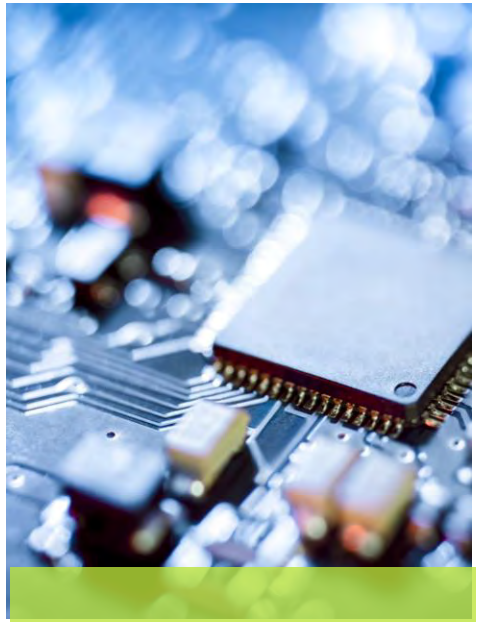
The text explores the potential of a futures market for recycled materials to reduce price volatility, improve transparency, and support sustainable business practices.

https://online.ucpress.edu/cse/article-abstract/9/1/2468716/213836/Building-Sustainable-Markets-Overcoming-Barriers?redirectedFrom=fulltext

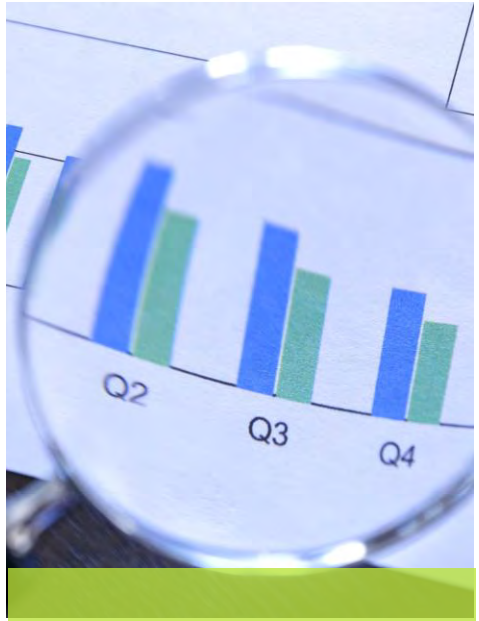
« BARRIERS AND WEAKNESSES IN SRM MARKET DEVELOPMENT »

Despite growing policy attention and economic potential, Secondary Raw Materials markets across Europe remain underdeveloped relative to their theoretical capacity. Understanding the barriers is the first step toward addressing them – and it is a core task for any GIM working in the circular economy space.

THE MAIN TECHNICAL, ECONOMIC AND REGULATORY BARRIERS AFFECTING SRM MARKET DEVELOPMENT.



Technical Barriers



Economic Barriers

Regulatory Barriers

TECHNICAL BARRIERS

Technical barriers relate to the physical properties of materials, the quality of collection and processing, and the availability of appropriate infrastructure.

Quality and Contamination

Recovered materials are often mixed, contaminated or degraded during collection. Secondary plastics collected in mixed streams, for example, typically contain residues from food, labels and incompatible polymer types that reduce their usability and market value.

Lack of Standardised Specifications

Buyers of secondary materials need confidence in consistent quality. Without harmonised EU-wide technical specifications for secondary materials, buyers struggle to compare offers across Member States or integrate SRMs into quality-assured production processes.

Absence of End-of-Waste Criteria

When a recovered material cannot legally exit waste status, it cannot be traded freely across borders or used in regulated production contexts. Many material streams still lack clear EU end-of-waste criteria, trapping potential SRMs in the waste regulatory framework.

Technology Gaps

Some recycling processes – particularly for complex products such as multi-layer packaging, mixed textiles and composite materials – still lack viable, scalable technologies for cost-effective recovery.

Traceability and Digital Data

Manufacturers increasingly require documentation of a material's origin, composition and processing history. Many SRM supply chains lack the digital infrastructure (material passports, blockchain traceability) to provide this.

ECONOMIC BARRIERS

Even where technical solutions exist, SRM markets frequently fail to develop because the economics do not work. Several interconnected factors create persistent economic disadvantage for secondary materials:

Economic Barrier	Mechanism and Impact
Price competition from raw materials	Primary commodity prices – especially plastics linked to oil prices – frequently undercut secondary materials. When oil is cheap, virgin plastic becomes cheaper than recycled plastic, collapsing demand for SRMs.
Lack of investor confidence	Investors and buyers perceive SRM markets as risky due to price volatility, quality inconsistency and regulatory uncertainty. This limits the capital available for recycling infrastructure.
High processing costs	Sorting, decontamination and reprocessing of secondary materials is often more labour- and energy-intensive than primary extraction, particularly for complex waste streams.
Market fragmentation	SRM markets are often local or national rather than European in scale, limiting liquidity, price discovery and the ability to match supply with demand efficiently.
Externalized costs	The environmental costs of primary material extraction (habitat destruction, carbon emissions, water use) are often not priced into raw material costs, creating an artificial price advantage over secondary alternatives.

REGULATORY BARRIERS

Regulatory frameworks designed for waste management have not always kept pace with circular economy ambitions. Key regulatory barriers include:

Inconsistent classification of waste and non-waste across EU Member States creates legal uncertainty for cross-border SRM trade.

Slow and costly permitting processes for new recycling and recovery facilities discourage investment even where demand exists.

Lack of minimum recycled content requirements in many product categories removes a key demand-pull mechanism for SRMs.

Lack of minimum recycled content requirements in many product categories removes a key demand-pull mechanism for SRMs.

Extended Producer Responsibility (EPR) schemes vary significantly across Member States in scope, coverage and enforcement, creating uneven playing fields for SRM market development.

Classification of certain recycled materials as hazardous – even when risk is low – prevents their use in regulated production contexts.

Reflection: Think about your own local or national context. Which of the three barrier types – technical, economic or regulatory – do you observe most in the SRM markets you know? Reflect on a specific example.

LEARN MORE

Self-learning

CLOSING THE LOOP: BARRIERS TO RECYCLING IN EUROPE

An EEA explainer on why recycling rates across the EU are not reaching potential – covering contamination, collection infrastructure gaps, economic disincentives and the absence of harmonised end-of-waste criteria across Member States.

Click to read full article

While you read – focus on:

- Which barrier type (technical, economic, regulatory) receives the most attention?
- Are any of the examples familiar from your own national or regional context?
- What solutions does the video suggest or imply?

LEARN MORE

Self-learning

CRITICAL RAW MATERIALS: EUROPE'S STRATEGIC RESPONSE

An overview of the EU Critical Raw Materials Act – why it was created, what it targets, and how secondary sourcing and urban mining are positioned as strategic responses to Europe's raw material dependency.

Critical raw materials

Page contents

- Why critical raw materials are important
- What the Commission does
- The methodology to identify CRMs
- Fifth list 2023 of critical raw materials for the EU
- Main global and domestic producers of CRMs
- Critical Raw Materials Act
- Material system analysis (MSA)
- Relevant links
- Contact

Raw materials are crucial to Europe's economy. They form a strong industrial base, producing a broad range of goods and applications used in everyday life and modern technologies. Reliable and unhindered access to certain raw materials is a growing concern within the EU and across the globe. To address this challenge, the European Commission has created a list of critical raw materials (CRMs) for the EU, which is subject to a regular review and update. CRMs combine raw materials of high importance to the EU economy and of high risk associated with their supply.

Why critical raw materials are important

- **Link to industry** - non-energy raw materials are linked to all industries across all supply chain stages
- **Modern technology** - technological progress and quality of life rely on access to a growing number of raw materials. For example, a smartphone might contain up to 50 different kinds of metals, all of which contribute to its small size, light weight and functionality.
- **Environment** – raw materials are closely linked to clean technologies. They are irreplaceable in solar panels, wind turbines, electric vehicles, and energy-efficient lighting.

What the Commission does

Click to read full article

While you read – focus on:

- Why does the EU consider certain materials 'critical' – what are the two defining criteria?
- What is the 15% secondary sourcing target and what does it mean in practice?
- How does this policy create opportunities for SRM market development at local level?

« OPPORTUNITIES AND THE ROLE OF EU POLICY »

OPPORTUNITIES AND THE ROLE OF EU POLICY

The same analysis that reveals barriers also reveals opportunities. Many of the **weaknesses** described above are being actively addressed by EU policy, technological innovation and shifting market conditions. For GIMs, understanding these opportunities is essential to positioning local initiatives within the wider system.

MARKET OPPORTUNITIES

Several structural trends are creating genuine growth opportunities for SRM markets across Europe:

Rising Raw Material Costs

Supply chain disruptions (amplified by geopolitical events since 2020) are making SRMs economically more competitive in sectors where they were previously marginal.

Corporate Sustainability & CSRD

Mandatory EU reporting (CSRD) is driving manufacturers to actively seek verified secondary material sources to meet recycled content targets and reduce Scope 3 emissions.

Binding Recycled Content Targets

The EU Battery Regulation (2023) and Packaging Regulation create legally binding minimum recycled content targets, generating guaranteed demand for secondary lithium, cobalt, aluminium and PET.

Digital Product Passports

Material traceability systems are emerging to solve information asymmetries that have historically prevented buyers from trusting SRM quality.

Industrial Symbiosis

Where one company's waste becomes another's input – increasingly facilitated by digital platforms and regional industrial strategies, creating new SRM market structures at local level.

EU POLICY ARCHITECTURE

Policy instruments shaping SRM demand & supply across all Member States

EU Policy Instrument	How it supports SRM markets
European Green Deal (2019)	Climate neutrality by 2050; circular economy as core pillar; resource efficiency as competitiveness priority.
Circular Economy Action Plan (2020)	Mandates recycled content in key categories; strengthens EPR; accelerates end-of-waste criteria.
Critical Raw Materials Act (2024)	15% domestic secondary sourcing of 34 strategic CRMs by 2030; monitoring obligations; investment in recovery.
EU Battery Regulation (2023)	Minimum recycled content thresholds for Li, Co, Pb, Ni – creating guaranteed secondary battery material demand.
Ecodesign for Sustainable Products Reg.	Products designed for disassembly and recyclability – improving future SRM supply quality and volume.
Packaging & Packaging Waste Reg.	Minimum recycled content in plastic packaging; harmonises collection and sorting; improves secondary plastic markets.

CRITICAL RAW MATERIALS ACT (2024)

- Covers 34 strategic Critical Raw Materials
- Creates binding monitoring & reporting obligations
- Unlocks EU investment in urban mining & recovery infrastructure
- Directly creates local demand for GIM-facilitated SRM systems

NATIONAL & REGIONAL INNOVATION

Beyond EU frameworks: where local change happens

Industrial Symbiosis Programmes

Connect companies to exchange materials, energy and water – creating local SRM flows where none existed. e.g. National Industrial Symbiosis Programme model adopted across EU regions.

Green Public Procurement (GPP)

National mandates for minimum recycled content in public tenders create stable, policy-driven SRM demand – decoupled from volatile commodity markets.

Deposit-Return Systems

Germany, Scandinavia, Estonia: high collection rates and improved secondary material quality. Estonia achieves >90% beverage container return rates.

Investment in Sortation Infrastructure

Advanced optical sorting, chemical recycling pilots and urban mining facilities improve technical capacity for consistent, high-quality SRM recovery.

Living Labs as Innovation Ecosystems

Used to pilot new SRM collection, sorting and trading models at community level – the direct territory of the Green Innovation Manager. (You can explored the Living Lab model in Module 3 of this programme – consider how those tools apply here.)

Click to read Fostering a circular economy at local and regional levels

Committee on Governance, Civic Engagement and the Environment (Governance Committee)

LEARN MORE

Self-learning

FOSTERING A CIRCULAR ECONOMY AT LOCAL AND REGIONAL LEVELS

A 2024 Council of Europe resolution examining how local and regional authorities can actively enable circular economy transitions – including SRM market development – through regulation, procurement, facilitation and citizen engagement. Directly relevant to the GIM's role.

Critical raw materials

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- **Environment** – raw materials are closely linked to clean technologies. They are irreplaceable in solar panels, wind turbines, electric vehicles, and energy-efficient lighting.

What the Commission does

Click to read full article

While you read – focus on:

- Which local-level actions are highlighted as most effective for enabling SRM market development.
- How the resolution frames the role of local facilitators (i.e. future GIMs) in bridging regulatory frameworks and community action.
- What barriers it identifies that can only be addressed at national or EU level – and what this means for local actors.

REFLECTION- EU POLICY IN CONTEXT

Identify one EU policy instrument from the table above that is directly relevant to your professional context or your local territory. Answer the following:

Which instrument did you select? _____

What material stream or sector does it affect in your territory? _____

What concrete demand or supply effect is it creating (or could it create)? _____

EXERCISE 1 — EU POLICY MATCHING TASK

Match each SRM market problem (left) to the EU policy instrument that most directly addresses it (right). Write the letter of your chosen instrument next to each problem. An instrument may be used more than once.

SRM market problem	Instrument (write letter)
1. A manufacturer needs to procure secondary cobalt to meet a legally binding recycled content requirement for batteries.	
2. A municipal waste authority finds that secondary plastic pellets from neighbouring countries arrive with no documentation of their composition or processing history.	
3. A packaging supplier must demonstrate that its plastic trays contain a minimum percentage of post-consumer recycled content to access a major retail contract.	
4. A product designer wants to build devices that can be more easily disassembled for material recovery at end of life.	
5. A regional authority wants to map local critical raw material flows and position itself for EU investment in urban mining infrastructure.	

Policy instrument key:

A – European Green Deal (2019) B – Circular Economy Action Plan (2020)
C – Critical Raw Materials Act (2024) D – EU Battery Regulation (2023)
E – Ecodesign for Sustainable Products Regulation F – Packaging and Packaging Waste Regulation

EXERCISE 2 — INDIVIDUAL SWOT ANALYSIS OF A LOCAL SRM MARKET

Objective

To apply a SWOT framework to analyse a secondary raw materials market from your local perspective — identifying what already works, what is missing, and what external forces are shaping the situation. This is an individual task completed during the synchronous session and used as the basis for a short group debrief.

Instructions

1. Select a specific local or regional SRM market to analyse. Examples: plastic packaging collection in your municipality; construction waste in your region; metal recycling in your sector.
2. Read the worked example below (one quadrant is completed for a fictional case). Use it to calibrate the level of specificity expected — name real actors, infrastructures, regulations and economic conditions.
3. Complete all four quadrants of your own SWOT template (aim for 3 points per quadrant).
4. Answer the two GIM Action prompts at the bottom of the template.

SWOT ANALYSIS OF SRM MARKETS AT LOCAL LEVEL

Apply a SWOT framework to analyse secondary raw materials markets from your local perspective – identifying what already works, what is missing, and what external forces are shaping the situation.

▲ STRENGTHS

Internal – what already works

1. _____
2. _____
3. _____

△ OPPORTUNITIES

External – factors that could help

1. _____
2. _____
3. _____

▼ WEAKNESSES

Internal – gaps and limitations

1. _____
2. _____
3. _____

⚠ THREATS

External – barriers and risks

1. _____
2. _____
3. _____

Select a local/regional SRM market • Complete all 4 quadrants

GIM ACTION PROMPTS — ANSWER AFTER COMPLETING YOUR SWOT

1. As a GIM in this territory, what would you prioritise as the entry point for intervention, and what would be your first concrete action?

2. Connecting to Module 3: What role could a Living Lab play in addressing the weakness or threat you identified? Who would you need to involve?

KEY TAKEAWAYS

1 SRM market barriers are technical, economic AND regulatory — all three must be addressed
2 EU policy (CRM Act, Battery Reg, CEAP) creates real demand — GIMs must know these instruments
3 Local action (Living Labs, symbiosis, GPP) is where GIMs can have the most direct impact

SELF-ASSESSMENT QUIZ

Quiz: Concepts & Functioning of SRM Markets

Q1 **What triggers the transition of a material from being legally classified as "waste" to a "Secondary Raw Material" (SRM)?**

A) The moment a citizen drops the material into a public recycling bin.

B) The completion of official "End-of-Waste" procedures where it meets specific industrial standards.

C) The collection of the material by a waste management truck.

D) When a manufacturer expresses interest in buying it.

Click any answer to see if you got it right.

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B) The completion of official "End-of-Waste" procedures where it meets specific industrial standards. ✓

C) The collection of the material by a waste management truck.

D) When a manufacturer expresses interest in buying it.

Why: *An SRM is only officially recognized once it passes clear criteria that strip away its legal status as waste, transforming it into a standard economic commodity.*

Next Question →

SELF-ASSESSMENT QUIZ

Quiz: Concepts & Functioning of SRM Markets

Q2 **A small workshop in your region collects used car tyres. Tyres have no agreed international grading and almost no local buyer wants them yet. Based on what you learned about market maturity, what should you expect?**

A) Tyres should trade easily, since rubber is a well-known material worldwide.

B) This is likely an emerging/unstructured market, so building local trust and simple sorting rules matters more than competing on price.

C) Tyres cannot become an SRM under any circumstances, since they are not metal or glass.

D) The Living Lab should wait for a large international recycler to set up locally before doing anything.

Click any answer to see if you got it right.

SELF-ASSESSMENT QUIZ — ANSWER

Quiz: Concepts & Functioning of SRM Markets

Q2 **A small workshop in your region collects used car tyres. Tyres have no agreed international grading and almost no local buyer wants them yet. Based on what you learned about market maturity, what should you expect?**

A) Tyres should trade easily, since rubber is a well-known material worldwide.

B) This is likely an emerging/unstructured market, so building local trust and simple sorting rules matters more than competing on price. ✓

C) Tyres cannot become an SRM under any circumstances, since they are not metal or glass.

D) The Living Lab should wait for a large international recycler to set up locally before doing anything.

Why: *Just like blended textiles or e-waste, a material with no agreed grading and almost no buyers is an emerging market, not a failed one. The Living Lab's job is to help build the missing structure (sorting standards, local buyers) – the same logic you saw for textiles, applied to a new case.*

Next Question →

SELF-ASSESSMENT QUIZ

Quiz: Concepts & Functioning of SRM Markets

Q3 **You are launching a circular economy project in your territory. Which material stream is an "emerging/unstructured" market where Living Lab innovation is most needed?**

A) Cullet glass.

B) Scrap steel and ferrous metals.

C) Blended textiles and multi-layer technical plastics.

D) High-density polyethylene (HDPE) pellets.

Click any answer to see if you got it right.

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Why: *Glass and metals have mature, globalized commodity markets. Textiles and multi-layer plastics are unstructured and lack clear specifications – perfect targets for Living Lab innovation.*

Next Question →

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Quiz: Concepts & Functioning of SRM Markets

Q4 **If global crude oil prices crash significantly, what is the immediate impact on the market for recycled plastics?**

A) Recycled plastics instantly become more attractive due to lower logistics costs.

B) Virgin plastics become cheaper than recycled plastics, and demand for secondary polymers collapses unless protected by policy.

C) The cost of sorting secondary polymers drops automatically.

D) Recyclers increase their profit margins due to oil price linkage.

Click any answer to see if you got it right.

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Why: *This is the "Virgin Commodity Trap." SRM markets are highly vulnerable to primary resource price drops unless stabilised by mandatory content quotas or other regulation.*

Next Question →

SELF-ASSESSMENT QUIZ

Quiz: Concepts & Functioning of SRM Markets

Q5 **What is the primary advantage of a Living Lab approach when dealing with highly fragmented material supplies from local SMEs?**

A) Living Labs can buy the materials at a higher price than global markets.

B) Living Labs possess the heavy machinery to recycle raw metals.

C) Living Labs can bring small amounts of material together from many businesses, creating one supply large enough to interest a recycler.

D) Living Labs enforce legal fines on SMEs that do not recycle.

Click any answer to see if you got it right.

Quiz: Value Chains & Market Dynamics

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Why: *Large industrial recyclers ignore tiny waste streams from individual SMEs. A Living Lab can coordinate these fragmented actors into a reliable regional supply pool.*

Next Question →

Quiz: Value Chains & Market Dynamics

Q6 **A region collects lots of used coffee grounds from cafes, but no factory nearby will buy them because each batch is mixed with napkins, stirrers and cup lids thrown in by mistake. Which stage of the reverse supply chain is breaking down here?**

A) Generation – cafes are simply producing too much waste.

B) Collection – trucks are not visiting cafes often enough.

C) Sorting & Upgrading – the material isn't being separated from contaminants before it reaches a buyer.

D) Regeneration – no factory exists that can process coffee grounds.

Click any answer to see if you got it right.

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Why: *The material is being generated and collected just fine – the breakdown is that nothing is removing the napkins, stirrers and lids before the grounds reach a buyer. This is the same failure pattern as the pizza-box example: without a sorting step, even a steady supply has no value to a factory.*

Next Question →

Quiz: Value Chains & Market Dynamics

Q7 **A local sorting facility is losing money because it costs more to transport collected plastic packaging than the material is worth. What structural failure is happening here?**

A) Contamination leak.

B) Volumetric cost trap (low material density over long distances).

C) Infrastructure friction due to faulty optical sensors.

D) Failure of Extended Producer Responsibility (EPR) classification.

Click any answer to see if you got it right.

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Why: *Transporting light, uncompacted materials (like loose bottles) over long distances destroys economic value. Compressing or pre-processing close to the source is essential.*

Next Question →

SELF-ASSESSMENT QUIZ

Quiz: Value Chains & Market Dynamics

Q8 **A waste management company wants high sale prices to cover its sorting investments, while a local manufacturer demands cheap inputs. How should a Living Lab Manager resolve this tension?**

A) Side with the manufacturer to ensure the product enters the market quickly.

B) Advise the public sector to take over the recycling company completely.

C) Act as a neutral trusted third party to co-design long-term off-take agreements that balance costs and minimize volatility risk.

D) Tell both actors to wait until global primary resource prices rise.

Click any answer to see if you got it right.

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Why: *Aligning conflicting incentives across public, private, and civil stakeholders is a core capability of a Living Lab Manager driving regional circularity.*

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Quiz: Value Chains & Market Dynamics

Q9 **What is the main purpose of EU rules requiring a minimum amount of recycled content in products?**

A) To guarantee a steady level of demand, so recycled materials don’t depend only on how cheap new materials happen to be.

B) To fund public collection trucks through eco-taxes.

C) To eliminate the need for reverse logistics networks entirely.

D) To force citizens to separate their household waste more accurately.

Click any answer to see if you got it right.

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D) To force citizens to separate their household waste more accurately.

Why: *Just collecting more waste is not enough. Rules that guarantee buyers (like minimum recycled-content laws) protect recyclers from sudden swings in the price of new materials.*

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SELF-ASSESSMENT QUIZ

Quiz: Value Chains & Market Dynamics

Q10 **[Scenario] A sudden drop in virgin raw material costs causes local manufacturers to stop buying your territory's secondary aggregates. Which initial intervention best leverages your ecosystem?**

A) Shut down the local sorting centre until primary resource prices recover.

B) Launch a marketing campaign asking citizens to pay higher waste fees.

C) Engage the local municipality to activate Green Public Procurement rules, mandating public construction projects to buy the local secondary aggregates.

D) Export the raw uncompacted aggregates to another country to cut local costs.

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Why: *Green Public Procurement creates an immediate, policy-backed demand floor that a Living Lab Manager can activate directly through the municipality – protecting the local value chain from international price shocks.*

THANK YOU FOR YOUR PARTICIPATION!

GREEN LABS PROJECT

The GREEN LABS project aims to support and stimulate the green transition by promoting innovation and greening of VET systems through internationalization, exchange of practices, and knowledge sharing among partners, in accordance with the Osnabrück Declaration of 2020 on vocational education and training for sustainable competitiveness, social fairness and resilience.

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